



MARSHALL STAR

Serving the Marshall Space Flight Center Community

July 7, 2005

NASA gives 'go' for Space Shuttle Return to Flight

NASA Headquarters release

NASA has cleared the Space Shuttle to Return to Flight. After a two-day Flight Readiness Review meeting at NASA's Kennedy Space Center in Florida, senior managers approved a July 13 launch date for Discovery.

Commander Eileen Collins and her crew are scheduled to lift off at 2:51 p.m. CDT on the first U.S. space flight since the February 2003 loss of the Shuttle Columbia.

"After a vigorous, healthy discussion, our team has come to a decision: we're ready to go," NASA Administrator Michael Griffin said after the meeting June 30. "The past two-and-a-half years have resulted in significant improvements that have greatly reduced the risk of flying the Shuttle. But we should never lose sight of the fact that space flight is risky.

"The Discovery mission, designated STS-114, is a test flight," Griffin said, noting that astronauts will try out a host of new Space

See Shuttle on page 5

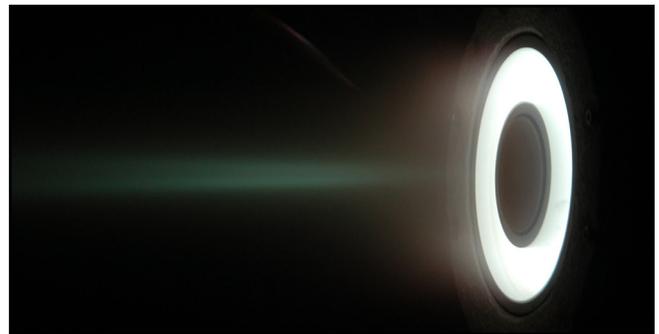


Photo by NASA/GRC

The High Voltage Hall Accelerator, or HiVHAC, puts out a faint blue glow during testing at NASA's Glenn Research Center in Cleveland.

Solar electric propulsion 'fast track' to deep space

By Sheri Bechtel

An important challenge facing NASA's Science Mission Directorate is finding a faster and less costly way of getting payloads to destinations in space.

Current technologies often require years to accomplish deep-space missions. But solar electric propulsion technologies can overcome these obstacles and improve

See Propulsion on page 3



Deep Impact kicks off Fourth of July with deep space fireworks

NASA Headquarters release

After 172 days and 268 million miles of deep space stalking, Deep Impact successfully reached out and touched comet Tempel 1. The collision between the coffee table-sized impactor and city-sized comet occurred at 12:52 a.m. CDT Monday, July 4.

"What a way to kick off America's Independence Day," said Deep Impact project manager Rick Grammier of NASA's Jet Propulsion Laboratory, Pasadena, Calif. "The challenges of this mission, and teamwork that went into making it a success, should make all of us very proud."

See Deep Impact on page 6

Unique Marshall lab tackles 'sticky' issue of lunar dust

By Rick Smith

In the safety-conscious, science-driven business of aerospace research, where laboratories routinely are set up as "clean rooms," in which sterility is paramount, Dr. Mian Abbas' lab at the National Space Science and Technology Center (NSSTC) is something of an anomaly. The word "dust" is even in its name.

Not that the "Dusty Plasma Lab" is any less well maintained than any other professional research facility. The dust found here comes from Earth's Moon.

That dust — barely a teaspoon full — is the focus of a vital study to help NASA send explorers back to the Moon in coming decades. Since April, Abbas, a Marshall Center space scientist, has been using a volleyball-sized vacuum chamber in the Dusty Plasma Lab to simulate the Moon's airless environment. With his partners, Marshall Center astrophysicist Dr. Paul Craven and Dragana Tankosic, a doctoral student in physics at the University of Alabama in Huntsville, Abbas is suspending grains of lunar dust, one at a time, in a vacuum in the chamber.

The team bombards each grain — part of a sample scooped up in 1972 by astronauts during the Apollo 17 Moon mission — with ultraviolet radiation. This gives each particle an electrostatic charge, similar to the charge a person acquires when walking across a heavy carpet in wool socks. Abbas and his partners study how dust grains in the lunar environment charge and discharge, shedding their electrostatic charge the way touching a metal door in a carpeted room can give a person a brief, tingling shock.

The goal for Abbas and his team is to log the physical characteristics and behavior of dust grains ranging in size from 2 microns to 20 microns — the particle sizes most likely to cause problems during long-term Moon missions. That's 20 to 200 times smaller than the period at the end of this sentence.

"Working with such tiny particles is a test of patience," Abbas acknowledges, smiling. "But we have much to learn about the properties and behavior of lunar dust if we hope to conduct long-term or even permanent science-oriented operations on the Moon."

That powdery dust coats much of the

lunar surface. A build-up of this dust could damage or destroy sensitive machinery and mechanical equipment without proper protection. As the Apollo astronauts discovered, lunar dust clings to everything, from gloves and boots to vehicles.

To date, no lunar landing mission has stayed on the surface long enough for the dust to pose a real concern. "But for future long-duration missions, we obviously need to pursue dust abatement and mitigation strategies," Abbas said. "We need to ensure sensitive equipment, vehicles and spacesuits are protected."

There's more at risk than machinery. Earlier this year, astrobiologists at NASA's Ames Research Center in Moffett Field, Calif., conducted laboratory studies that suggest lunar dust could pose human health threats. The dust motes aren't poisonous, but unlike dust on Earth, buffed by atmospheric friction and interaction with the elements, lunar dust remains coarse and jagged. If inhaled — when astronauts track the dust back into their pressurized landers or flight vehicles — particles could embed themselves in the lungs like burrs, and cannot be easily expelled. The potential result? Long-term ailments similar to silicosis, a respiratory illness typically contracted by stonecutters and others exposed to ground-up or blasted rock.

Lunar dust research at Marshall and the NSSTC is expected to continue into 2007 and beyond, Abbas said.

"We are making unprecedented observations and developing mathematical models for the behavior of these dust particles," he says. "Not only will this research enable NASA to learn to efficiently remove accumulated dust, but in time it could lead to advances such as dust-repellent clothing, hardware and building materials."

Advances, no doubt, that will leave those pesky lunar particles in the dust.

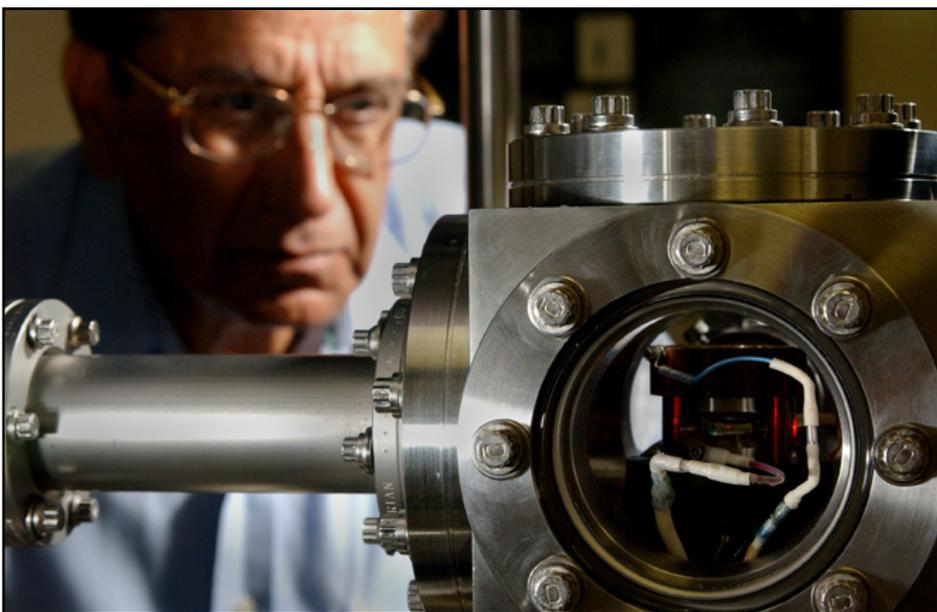


Photo by NASA/MSFC

Dr. Mian Abbas watches as a single grain of lunar dust — taken from the Moon during the Apollo 17 mission — is isolated in a vacuum chamber at the National Space Science and Technology Center.

The writer, an ASRI employee, supports the Public and Employee Communications Office.

Propulsion

Continued from page 1

scientific discovery throughout our Solar System.

Solar electric propulsion technology converts solar radiation to electrical power, which is used to create and accelerate ions in a propellant, producing exhaust velocities more than 10 times those possible with chemical systems. The low but steady acceleration of this propulsion system is significantly more efficient than chemical alternatives, and enables shorter trip times for certain classes of science missions.

Through partnerships with researchers in academia, industry and other government agencies, Marshall's In-Space Propulsion Technology Office is NASA's focal point for the necessary technology development and integration of these technologies. The office is responsible for investigating and developing in-space propulsion technologies that can enable or benefit near- and mid-term NASA science missions by significantly reducing cost and travel times, and increasing payload capacity aboard robotic exploration vehicles.

The Marshall office and its partners are advancing solar electric propulsion and other technologies to a technology readiness level

of six. That category is applied when a technology is ready to be flight demonstrated. This status is achieved through ground testing to verify that all elements, including systems and subsystems, meet requirements.

To verify the technology can operate efficiently over a wide range of power levels, the solar electric propulsion team is testing the High Voltage Hall Accelerator, or HiVHAC, at Glenn Research Center in Cleveland, Ohio. The HiVHAC effort is managed by Marshall's In-Space Propulsion Technology Office, and developed and conducted by Glenn.

Low-power operation is particularly important because it allows spacecraft to continue thrusting in space far from the Sun, where there is little solar flux available to be absorbed by a craft's solar arrays. It is a capability impossible with most state-of-art propulsion technologies.

For more information, visit inspacepropulsion.com.

The writer, an ASRI employee, supports the Public and Employee Communications Office.



Photo by NASA/MSFC

Stuhlinger visits Propulsion Research Lab

Dr. Ernst Stuhlinger, left, the Marshall Center's first science director and an original member of Wernher von Braun's rocket development team during the early days of NASA, recently visited Marshall's Propulsion Research Laboratory. Stuhlinger, considered by many propulsion scientists to be the father of electric propulsion, was invited to the laboratory for a tour and to offer insights about key propulsion research efforts under way at the facility. Research engineer Dr. Tom Markusic, right, of the Propulsion Research Center at Marshall, consulted with Stuhlinger about Markusic's efforts to develop innovative electric propulsion systems that use liquid bismuth — a soft, non-toxic, non-carcinogenic metal — and other liquid metal propellants. Development of such advanced propulsion systems is the cornerstone of the Propulsion Research Laboratory, one of NASA's leading facilities of its kind.

One NASA e-mail for contractors postponed

The Office of the Chief Information Officer announced the One NASA e-mail for contractors, scheduled for roll-out July 6, has been postponed and will be scheduled at a later time.

The One NASA e-mail for contractors is a NASA-wide initiative to develop a more unified structure for e-mail services. For example, when completed, all personnel will have the following address:

firstname.middleinitial.lastname@nasa.gov
(example: jane.a.doe@nasa.gov) instead of
firstname.lastname@msfc.nasa.gov

The Office of the Chief Information Officer is supporting this major area of emphasis -- the e-mail system -- associated with the Agency's One-NASA initiative. Marshall has been working alongside other NASA centers to develop the plan for moving the Agency to a more unified structure for e-mail services. NASA Headquarters has already implemented this change for its contractors.

For answers to questions concerning this activity, visit <https://onenasa.ndc.nasa.gov/> or call 4-HELP (544-4357), Option 7.

Space Shuttle prime contractors receive Marshall awards

By Sanda Martel

The Marshall Center recently honored four Space Shuttle prime contractors for their commitment to making subcontracting opportunities available to small and disadvantaged businesses.

The awards were presented by Chip Jones, Marshall Center Resident Office Manager at the Michoud Assembly Facility in New Orleans, during the NASA Regional Business Forum in New Orleans June 22-23.

Receiving awards were ATK Thiokol

Propulsion of Brigham City, Utah; The Boeing Company, Rocketdyne Propulsion & Power of Canoga Park, Calif; Lockheed Martin Space Systems Company, Michoud Operations, of New Orleans; and United Technologies Corporation, Pratt & Whitney Liquid Space Propulsion, of West Palm Beach, Fla.

The companies were recognized for exemplary performance and commitment in implementing NASA's goals through subcontracting and outreach activities.

During the last 10 years, Space Shuttle prime contractors have provided

subcontracting opportunities worth more than \$2.6 billion to small businesses, small disadvantaged businesses and women-owned small businesses.

The forum was co-sponsored by the Marshall Center; the Johnson Space Center in Houston; the Stennis Space Center in Mississippi; the Kennedy Space Center in Florida; and the New Orleans Chamber of Commerce.

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Marshall Center's historical archives going electronic

By Sheri Bechtel

Searching through the Marshall Center's history may someday be only a mouse click away.

The Marshall Historian's Office is using a new software program to transfer the Center's archives to an electronic format. Converting the paper documents to the new format will allow the archives to be searchable on CD or DVD.

"This is a faster, more efficient way to locate data," said Mike Wright, the Marshall historian. "It not only makes Marshall's historical information more accessible, but also more convenient and easier to navigate. A researcher can search a document word-by-word and, in a matter of moments, have specific information about an event, program or person."

Wright is using the Portable Document Format, or PDF, for document scanning and archiving to accomplish the undertaking. So far, more than 5,000 files have been scanned, including press kits from the Apollo-era Moon missions, the diary of Dr. Wernher von Braun, Marshall's first Center Director; and an extensive collection of Skylab mission transcripts. "Each transcript was about as thick as a New York City phone book," added Wright. "The complete stack would reach the ceiling."

The most requested documents are

being converted to DVD or CD first. Other documents scanned and now on disc include the Marshall Star, dating back to the first issue in 1960; facilities' history data; and Marshall phone books and organizational charts. Historical video tapes and photos also will be converted to the electronic format.

The archives provide historical data to Marshall team members who need information to accomplish their work.

Two Marshall organizations are assisting Wright. Reproduction Services in Building 4200 is helping scan bulk quantities of

documents. The Documentation Repository in Bldg. 4491 is scanning documents that include foldouts and schematics.

The project began in 2004, when the federally funded New Economy Institute of Chattanooga, Tenn., launched a program to help Marshall and other federal agencies learn more about the PDF format and how to convert large volumes of paper files into a searchable electronic format.

The writer, an ASRI employee, supports the Public and Employee Communications Office.



Photo by NASA/MSFC

Wright scans a document from one of the thousands of historical files in the Marshall Center archives.

NASA and Marshall launch new employee orientation program

By Sanda Martel

The NASA Employee Orientation Program (NEOP), a Web-based program for new, detailed and transferring employees, was rolled out July 1 when the Headquarters' NEOP Web site "went live."

The Web site was established to welcome civil servants, contractors, students, military detailees, intergovernmental personnel assignees and presidential appointees to the NASA family. It provides essential information employees need to begin working at NASA centers and allows them to complete online employment forms and documents.

From the Headquarters' orientation portal, new employees at the Marshall Center, as well as other NASA Centers, are directed to their respective Center's page, where pre-employment forms and documents are to be completed before reporting to work. Web addresses, links to Internet sites, user identifications and passwords are provided to each employee in a pre-employment letter.

Previously, new employees were provided a pre-employment package containing essential information about their NASA employment, including hard copies of required documents and forms, which they were to complete and return.

Another component of the new program is the assignment of a

sponsor to each new employee — a person to help orient the new hire to the job site and the Huntsville area.

Also linked to the Marshall employee orientation page are Shuttle Resident Office contacts; the Marshall organizational chart, mission statement and implementation plan; Marshall historical information; and information about the Vision for Space Exploration.

This Web-based initiative helps a new or transferring employee become a fully functioning member of the work force more quickly, and also is a more effective way to process employees, said Dawn Stanley of the Human Capital Office and Marshall lead for the program.

"OneNASA and OneHR, or Human Resources, programs require a common, integrated Agency-wide focus," said Stanley. "The NASA Transformation also is causing a more mobile work force — potentially resulting in more employee transfers than new hires." The transformation was a NASA Headquarters' initiative that began in 2004 — to streamline NASA's organization structure and position it to better implement the Vision for Space Exploration.

The Web address for the NASA Employee Orientation Program is: <http://employeeorientation.nasa.gov/msfc/default.htm>

The writer, an ASRI employee, supports the Public and Employee Communications Office.

Shuttle

Continued from page 1

Shuttle safety enhancements. In addition, Discovery will carry 15 tons of supplies and replacement hardware to the International Space Station. July 13 is the beginning of three weeks of possible launch days that run through July 31.

NASA's Associate Administrator for Space Operations, William Readdy, chaired the Flight Readiness Review, the meeting that traditionally sets launch dates and assesses the Shuttle's fitness to fly.

"Today's decision is an important milestone in returning the Shuttle to service for the country. Our technical and engineering teams are continuing their in-depth preparations to ensure that Eileen and her crew have a successful mission," he said.

Joining Collins aboard Discovery will be pilot Jim Kelly and Mission Specialists Steve Robinson, Andy Thomas, Wendy Lawrence, Charlie Camarda and Soichi Noguchi,

a Japan Aerospace Exploration Agency astronaut. The crew will test design changes that will reduce the chances of damage to the Shuttle, procedures for in-flight inspection of the Space Shuttle heat shield, and repair techniques — all in response to the Columbia accident. The mission also features three spacewalks, including one to replace a Space Station gyroscope.

Aboard the Station, Expedition 11 Commander Sergei Krikalev, a Russian Federal Space Agency cosmonaut, and Flight Engineer and NASA Station Science Officer John Phillips will greet Discovery. Krikalev and Phillips are on a six-month mission. They have been aboard the Station since April 17.

Returning the Space Shuttle to flight is the first step in the Vision for Space Exploration, a plan for humans to journey into the cosmos. The Space Shuttle will be used to continue construction of the International Space Station, a crucial test bed for exploration missions.



Space Shuttle Discovery undergoes final preparations before launch.

Deep Impact

Continued from page 1

"This mission is truly a smashing success," said Andy Dantzler, director of NASA's Solar System Division. "In the days ahead, we will know a lot more about the origins of our solar system."

Official word of the impact came five minutes after impact when, at 12:57 a.m. CDT, an image from the spacecraft's medium resolution camera was downlinked to the computer screens of the mission's science team, and showed the tell-tale signs of a high-speed impact.

The hyper-speed demise of the Deep Impact probe generated an immense flash of light, which provided an excellent light source for the two cameras on the Deep Impact mothership. Deep Impact scientists theorize the 820 pound impactor vaporized deep below the comet's surface when the two collided at a speed of 6.3 miles per second.

"The image clearly shows a spectacular impact," said Deep Impact principal investigator Dr. Michael A'Hearn of the University of Maryland, College Park.

"You can not help but get a big flash when objects meet at 23,000 miles per hour," said Deep Impact co-investigator Dr. Pete Schultz of Brown University, Providence, R.I. "The heat produced by impact was at least several thousand degrees Kelvin and at that extreme temperature just about any material begins to glow. Essentially, we generated our own incandescent photo flash for less than a second."

The flash created by the impact was just one of the visual surprises that confronted the Deep Impact team. Preliminary assessment of the images and data downlinked from the flyby spacecraft have provided an amazing glimpse into the life of a comet.

"They say a picture can speak a thousand words," said Grammier. "But when you take a look at some of the ones we captured in the early morning hours of July 4, I think you can write a whole encyclopedia."

"The final image was taken from a distance of 18.6 miles from the comet's surface," said A'Hearn. "From that close distance we can resolve features on the surface that are less than 4 meters

across. When I signed on for this mission I wanted to get a close up look at a comet but this is ridiculous ... in a great way."

The celestial collision and ensuing data collection by the nearby Deep Impact mothership was the climax of a very active 24 hour period for the mission which began with impactor release at 1:07 a.m. CDT on July 3. Deep space maneuvers by the flyby, final checkout of both spacecraft and comet imaging took up most of the next 22 hours. Then, the impactor got down to its last two hours of life.

"The impactor kicked into its autonomous navigation mode right on time," said Deep Impact navigator Shyam Bhaskaran, of JPL. "Our preliminary analysis indicates the three impactor targeting maneuvers occurred on time at 90, 35 and 12.5 minutes before impact."

At the moment the impactor was vaporizing itself in its 6.3 miles a second collision with comet Tempel 1, the Deep Impact flyby spacecraft was monitoring events from nearby and will continue to do so for several days.

Deep Impact will provide a glimpse beneath the surface of a comet, where material from the solar system's formation remains relatively unchanged. Mission scientists expect the project will answer basic questions about the formation of the solar system, by offering a better look at the nature and composition of the frozen celestial travelers known as comets.

The University of Maryland is responsible for overall Deep Impact mission science, and project management is handled by JPL. The spacecraft was built for NASA by Ball Aerospace & Technologies Corporation, Boulder, Colo.

The Deep Impact mission is part of the Discovery and New Frontiers Program. In August 2004, the Discovery and New Frontiers

Program Office was established at the Marshall Center to oversee and support missions selected and to assure successful implementation. Todd May heads the program office and Todd Holloway is Discovery and New Frontiers Program Office mission manager for Deep Impact.

For information about Deep Impact on the Internet, visit: www.nasa.gov/deepimpact



Photo by NASA/MSFC

New flight directors visit Marshall

The newest team of NASA flight directors — chosen in April to lead future space missions — visited the Marshall Center June 28. A flight director has the overall responsibility to manage and carry out Space Shuttle flights and International Space Station expeditions. They toured the Payload Operations Center, Bldg. 4663, where they met members of the flight controller team with whom they will be working. From left are visiting flight directors Robert Dempsey, Michael Sarafin, Ginger Kerrick, Holly Ridings, Richard Jones, Dana Weigel, Michael Moses and Brian Smith.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, then go to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitch, i.e., "like new" or "excellent condition." Deadline for submissions for the next issue is 4:30 p.m. Thursday.

Miscellaneous

Porsche 928 V8 engine, CIS K-Jetronic fuel injection; bell housing; clutch assembly. 797-8895

Dark wood chest, \$75; computer desk, \$50; hanging lamps, \$50; electric slicer, \$10. 534-0939

Craftsman riding mower, 7HP Tecumseh, runs & mows, needs work, \$100. 256-797-1012

Multiple pieces of solid Pine paneling, 8' tall x 8" wide, make offer. 256-508-7388

New Bissell steam mop, #1867, \$60; Graco toddler car seat, \$15. 655-6293

New Dell 8400 LCD monitor, 19", DVD/CD burner, 3.2Ghz-P4, 256Mb-NVidia 6800, \$1,250. 251-650-2385

Medium size tank colored recliner, \$40. 885-2005

Coat, large, 3M insulate, brand Mossy Oak Tree Stand, never worn, \$50. 776-9810

Mahogany dining room table, solid table (no leaf), china cabinet & 10 wickerback seats, \$1,000. 350-1011

Diamond cluster heart-shaped ring, \$100. 683-1279

Rattan wicker pedestal square rounded corner glass top table w/4 chairs, blush, make offer. 772-7262

Decorator antique beer/liquor mirrors, \$35 each; sofa table and curio shelf, \$135 each. 922-9311

Madam Alexander dolls, Wizard of Oz, set of 6, \$400. 533-9683

GE cordless bedroom phone with am/fm clock radio, dual alarm, white, \$25. 256-533-5942

Couches: one antique floral w/hand-carved base, \$500; one beige/light green, \$250. 772-4646

Wedding dress, professionally preserved for three years, size 12. 489-6214

Upright freezer, 17 cu. ft., white, \$200. 772-5823

Whirlpool refrigerator, 25 cu. ft., almond, side-by-side, ice/water dispenser, \$325. 859-6636

Pilates Performer and stand, \$225. 828-9099

Sony video/DVD/recorder, never used, \$400. 919-413-1015

Troybuilt riding lawnmower, 46" cut, 21HP engine w/16 hours, \$1,900. 895-9592

Kilim rug, 10'x13', wool-on-wool, earth tones, authentic hand made tribal rug, \$600. 489-1933

Refrigerator, 2 yrs. old, approximately 6 cu. ft., white, \$45. 468-0854/Steve

Alpha Omega 3-in-1 car seat, \$65; white rattan queen headboard, \$45. 534-3948

Four tickets to Wiggles Show at VBC, July 30, 5 p.m., \$125. 830-0254

Spinet piano, maple, \$700; sofa and loveseat, sage tweed, 5 yrs. old, \$250. 457-3355

Bob Timberlake's Ella's Rooster dinnerware, eight 5-piece place settings, 45 pieces total, \$100. 882-6366

Washer & dryer, \$75 each or \$125 for both. 714-0581

Frigidaire refrigerator, 21 cu. ft., white, approx. 4 yrs. old, \$300. 883-1003

Max-load heavy duty wall mounted shelving, 32"x4" sections, \$100. 658-3901

Octagon glass top table & chairs, Craico adjustable high chair, twin white metal girl's bed. 829-0776

Kenmore refrigerator, top freezer, ice maker, \$150. 585-0473

AKC/CKC Maltese, 3F/1M, ready 7/07/05, 6-weeks, first shots, deposits accepted, \$500. 256-797-0408/Kesia

Vehicles

1999 BMW 328iC convertible, white, gray leather, 5-speed, Premium/Sport & H-K, 86K miles, \$17,995. 837-1035

2001 Chevy Suburban LT, 58K miles, all options, new tires, 100K warranty, \$21,250. 256-883-1693

2000 Kawasaki KDX200, low mileage, \$1,700. 256-353-6635

1998 BMW 740iL, hunter green, tan leather, 105K miles, new tires, \$15,000. 682-0888

1997 Dodge Ram 1500, 5.9L/V8, auto, club cab, 167K miles, leather, 3" lift, \$8,500. 256-228-9513

1998 Grand Prix, GPS package, auto, leather, 4-door, 96K miles, black, \$6,900. 776-0811 after 6 p.m.

2002 Quicksilver Corvette A4 coupe, loaded, less than 19K miles, \$28,000. 256-895-8514

2002 Ford F250 Lariat crew cab, white, 7.3 diesel, 4x4, 136K miles, \$22,000. 256-497-3518

2003 Nissan Pathfinder, V6/auto, 2WD, tow package, 4-door, 27K miles, CD, silver/charcoal leather, \$22,000. 880-3337

1992 Buick LaSabre, 175K miles, \$350; 1993 Honda Civic, 4-door, 174K miles, needs work, \$200. 895-6716

1992 Yamaha FZR 600R, 22K miles, engine A, \$3,000; 1964 Chevy Biscayne, runs, \$2,400. 256-990-1842

Wanted

Refrigerator, at least 17 cu. ft., in good working condition. 468-4406

Four tickets: Auburn football home games; Georgia Tech, Mississippi State, Western Kentucky, or South Carolina. 830-2806

Disney videos. 585-0473

Quiet treadmill, basic, no frills. 961-2410

Free

Kittens, bob tailed. 828-3181

To good home, AKC German Shepherd female, 10-yrs. old, great w/kids, show dog, moving. 919-413-1015

Silver tabby cat, 4 yrs. old, chubby, loving, best as only cat. 457-3355

Pot belly pig, 20 pounds, less than 1 year old, gentle. 337-2801

Female Husky, 1-year old, friendly, great w/kids, needs room to run. 479-2651

Moving boxes. 651-7640

Baby clothes, 3 boxes, different sizes for infant baby boy. 919-413-1015

Obituaries

Aaron G. Loughead, 82, of Huntsville, died June 25.

Mr. Loughead retired from the Marshall Center in 1995 as an electrical engineer. He was also a World War II veteran.

Survivors include his wife, Marion Certain Loughead; a brother, Tom Loughead; and sisters, Carol Combs and Jane Evans.

Russell E. Alverson, 87, of Huntsville, died June 28.

Mr. Alverson retired from the Marshall Center in 1974 as a supervisory general supply specialist. He was also a

World War II veteran.

Survivors include his wife, Maxie Louise Pugh Alverson.

Dawn M. Christian, 41, of Madison, died June 30. She was an administrative support assistant in the Propulsion Research Center at the Marshall Center at the time of her death.

She is survived by her husband, Bobby Christian; son, Alan Christian; daughter, Lauren Christian; parents, Robert Adams and Janice Adams; and sisters, Debbie Oden and Kim Robinson.

NASA team testing advanced solar power technology at Marshall

By Rick Smith

Researchers at the Marshall Center took advantage of the early summer glare in May to test a solar thermionic diode — an innovative power source that could play an important role in future Solar System exploration.

The thermionic diode is a device that converts heat into electrical current. It is attached to a high-temperature heat absorption cavity, or receptor. The 150-pound assembly, approximately 3 feet long, 2 feet high and 2 feet wide, sits within a small vacuum chamber atop a test tower. It is dwarfed by the massive, honeycomb-shaped solar concentrator behind it, approximately 19-1/2 feet in diameter. A large, high-performance heliostat, or sun-tracking mirror, directs solar energy toward the concentrator's curved, reflective surface, which focuses the sunlight into the heat absorption cavity. This stored heat drives the diode, which produces voltage and current. The lightweight power source is designed to store large amounts of heat for long periods of time, eliminating the need for batteries or other heavy power storage devices that could crowd the limited mass and volume available for use on spacecraft.

The test series, expected to continue through the summer, is being conducted at the Propulsion Research Center's Solar Thermal Facility at the Marshall Center. The tests are intended to measure how effectively the diode converts heat to

electrical energy, and how well it can sustain power output for extended periods of time. Future testing will use a sun-tracking, inflatable concentrator in the Propulsion Research Laboratory to capture solar energy.

NASA expects this technology could one day be applied in space, using flexible, inflatable concentrators to generate large amounts of heat and electricity for a variety of uses, including power for harvesting and processing resources on other worlds, and electrical power for spacecraft and surface operations on the Moon or Mars. Thermionic devices also may provide a solar power solution for flight applications into the

inner Solar System.

The project, initiated under NASA's Small Business Innovative Research program, is led by United Applied Technologies of Huntsville. General Atomics of San Diego, Calif., is responsible for design and performance evaluation of the diode. In addition to the Propulsion Research Center, the team includes Auburn University in Auburn, Ala., and the Advanced Optical Systems Branch of Marshall's Science and Technology Directorate.

The writer, an ASRI employee, supports the Public and Employee Communications Office.

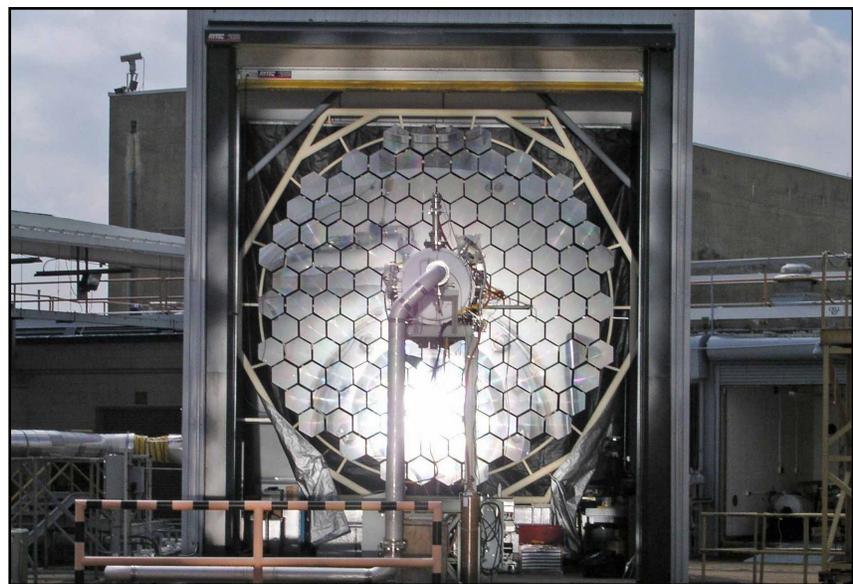


Photo by NASA/MSFC

A 19.5-foot diameter concentrator focuses solar energy into a solar thermionic diode undergoing testing at the Marshall Center's Propulsion Research Laboratory.

MARSHALL STAR

Vol. 45/No.41

Marshall Space Flight Center, Alabama 35812
(256) 544-0030
<http://www.nasa.gov/centers/marshall>

The Marshall Star is published every Thursday by the Public and Employee Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Contributions should be submitted no later than 5 p.m. Friday to the Marshall Public and Employee Communications Office (CS20), Bldg. 4200, room 103. Submissions should be written legibly and include the originator's name. Send electronic mail submissions to: intercom@msfc.nasa.gov The Marshall Star does not publish commercial advertising of any kind.

Manager of Public and Employee
Communications — Dom Amatore
Editors — Patricia Dedrick Lloyd, Debra Valine

U.S. Government Printing Office 2005-733-048-20006

Permit No. G-27
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